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Stang TV's New 2011 Mustang Project Car Gets Tuned by SCT's SF3

by Mark Gearhart (http://www.stangtv.com/author/markpowertv/) on January 13, 2011

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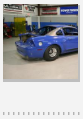
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2012 Ford Mustang Boss 302 on the Dyno at NAIAS

It is hard to keep off the automotive crack addiction known as performance parts. So what if a 2011 Mustang comes with 412 horsepower stock? It is never enough, that is, until you start breaking parts on a normal basis. One of the easiest and first power improvements you can do to your new hot rod is a tuner, and that is exactly what we did on our new 2011 Mustang project called "Wild E. Coyote".

The Sterling Gray Metallic, 6-speed manual 2011 Mustang is my personal daily driver. We have a whole gaggle of articles in store for our new five-point-oh; ranging from power, handling, and aesthetic upgrades. The end goal is a Mustang that can eclipse 1G on the skid pad while being able to run solid ten-second quarter mile times. Our first step towards that goal was a **SCT (http://www.sctflash.com)** SF3 tuner with a custom **Brenspeed (http://www.brenspeed.com)** Race tune.

(http://2475-stangtv.voxcdn.com/files/2011/01/IMG_2446.jpg)

Our newest project car - a Sterling Gray Metallic, 6-speed manual 2011 Mustang GT

With 800 miles on the odometer at the time of the install, I had gone about 799 miles longer than I wanted before we started upgrading the Mustang. Before putting the Mustang on our Dynojet, I loaded the SCT strategy tune and Brenspeed Race tune on two separate days to see how they felt while driving. With a 80 mile commute everyday, a lot could be accomplished in that time frame.

Driving Impressions Stock, SCT Strategy, and Brenspeed Race

Driving a 2011 Mustang is fun; it revs to 6800 RPM and has gobs of power on demand. To keep the power on demand manageable for most of the general public, Ford engineered torque management strategies that delays the power delivery under light and full throttle applications. While this also serves as a safety feature, is also the Mustang's biggest downfall. When you rotate your right foot over the loud pedal, the Mustang lags almost like it has a big turbo on it, while it progressively delivers the torque to the rear wheels. Also, overall the throttle response in all situations is less than desired.

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Brenspeed Race Tune

Brenspeed, like many SCT custom tuning dealers, offers their own version of their mail order tunes. Their tunes are more aggressive from a air/fuel and ignition mapping perspective than the SCT strategy tune, but still safe enough to run whatever octane fuel level you require (91 octane in our case). "We run a more aggressive timing table than the SCT tune, along with a more efficient air fuel table," explained Brent White, owner of Brenspeed. "There is absolutely nothing wrong with what SCT is doing; we are just spending more time fine tuning the performance areas of the tune because Mustang's are our niche and we dyno them every single day."

(http://2475-stangtv.voxcdn.com/files/2011/01/IMG_2312.jpg)

Custom tunes must be loaded from a PC computer if not supplied by the retailer. The process is simple and is done with the SCT software supplied with the tuner.

Outside of the extra power, Brenspeed spent a lot of time playing with the torque management and throttle body calibrations. As White explained, "We also run different drive by wire tables than SCT which makes the car more aggressive on the street, and we have a few more changes to torque management areas of the Ford tune than SCT does. All of our changes gives you more control of the car, and a more powerful beast."

What does all this mean? It means anytime you want torque, just touch the throttle a fraction of an inch and you will feel the difference. There isn't anyway you could mistake a stock Mustang for a Brenspeed-tuned Mustang. The power comes in strong right off idle and under cruising or racing conditions, the throttle pedal responds with F1-like accuracy. Brenspeed thinks it might be too sensitive for some people and includes a tamer street tune, though I have to admit, I love it.

SCT Strategy Tunes

We have talked the Brenspeed tune up so much, why would you want to run the strategy tune now, right? Well that's not the case for a lot of people. SCT's canned tunes deliver more-than-safe air/fuel and timing tables to the 2011 GT. "Being a completely new engine/PCM combo in the 2011 Mustang GT, we quickly realized we needed to purchase a car to begin development on the new Mustang," said Tim Roi of SCT. "SCT was one of the first in our area to receive a beautiful Kona Blue 2011 Mustang GT, but its life took a quick turn once it arrive at our facility. With only a handful of miles on the odometer, it was quickly strapped down on our in-house Dynojet and the development of tunes for it began."

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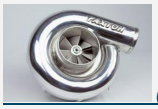
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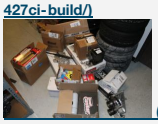
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Supercharging Systems
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"Program Vehicle" loads the SCT Strategy tune. Scrolling left or right will get you to the "Custom Tunes" screen where up to three tunes can be loaded at one time.

Also, it does improve on the torque management delivery and throttle response. The best explanation would be that the canned tune is a midway compromise in drivability and power when you compare the Brenspeed tune to stock. "For the most part, developing the tunes was nothing out of the ordinary for us, but the mastering the new Twin Independent Variable Cam Timing proved challenging at times, but as you can see by the HP & TQ gains, I think we figured it out," said Roi.

The other great aspect about the SCT canned tunes is that there are provisions for different modifications being made to the car, mainly air intake manufactures. While there are many "no tune" intakes on the market, being able to take advantage of the additional incoming air at no additional cost over the price of the tuner is beneficial. "SCT is constantly adding new tune files and user selectable options for the most common cold air intake kits and bolt-ons," said Roi. "We work closely with cold air kit / bolt-on manufacturers by testing their products on each vehicle to ensure when you purchase an SCT device, a cold air kit or other bolt-on, you get the maximum horsepower & torque from your tune and modifications."

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Loading the Tunes onto the PCM

1) You must locate the OBD-II port on your vehicle, which is underthe driver's side of the dash, next to where your left leg would sit. Plug the tuner in with the vehicle in the ignition key in the 'off' position. The "program vehicle" screen will be the first screen you come to when programming a vehicle with the X3/SF3 devices.

2) Select 'Program Vehicle' from the on-screen menu. The device prompts the user to turn the ignition key to the 'on' position. The SF3 will detect any Ford vehicle supported automatically. There is also a "Custom Tunes" screen that you can access by scrolling the left and right arrows in the initial screen prompt. This is how we access our Brenspeed files later.

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Before you load the tune, make sure to adjust the fuel octane level, rear gear ratio (even if you ordered a 3.73 rear gear from the factory), air intake, and wheel sizes outside stock. The rear O2s delete can be used to eliminate check engine lights when running an off road H or X pipe.

If the tuner is a pre-loaded device (SF3 and TSX), the vehicle is automatically identified and the tuner prompts the user to press a key to continue. Before loading the tune, you can adjust a wide range of user selectable options, like transmission shift firmness, rev limiter, rear gear ratio, and the tire size selector. If you have access to a dyno and a wide band oxygen sensor, you can test your vehicle to optimize the spark and fuel adjustments to further improve your tune.

(http://2475-stangtv.voxcdn.com/files/2011/01/IMG_2317.jpg)

SCT continually develops tunes for popular engine modifications that can benefit from a tune. Currently supported is five intake tunes.

4) The SCT device will then read the stock program from the vehicle and store a copy of it within the flash device. It also verifies the stock tune was read and backed up correctly before erasing it from the ECU's memory. The flash device then uploads the user selected pre-loaded SCT tune file or the custom tune file created by the SCT dealer to the vehicle's ECU.

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5) If the need arises to return the vehicle back to the stock tune, simply plug in the device again, select "return to stock" from the on-screen menu, and it goes through the same process to reload the factory programming. Once a vehicle is programmed with the tuner, it is 'locked' to that vehicle by using the vehicle's VIN number, though it can be returned stock to unlock the tuner.

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On The Dyno

Before loading any of the tunes onto the PCM, we baselined our 2011 Mustang GT. Results were impressive, considering we are on California 91 octane pump gas – **363 RWHP and 331 lb/ft of torque** that hit the rev limiter at 6800 RPM.

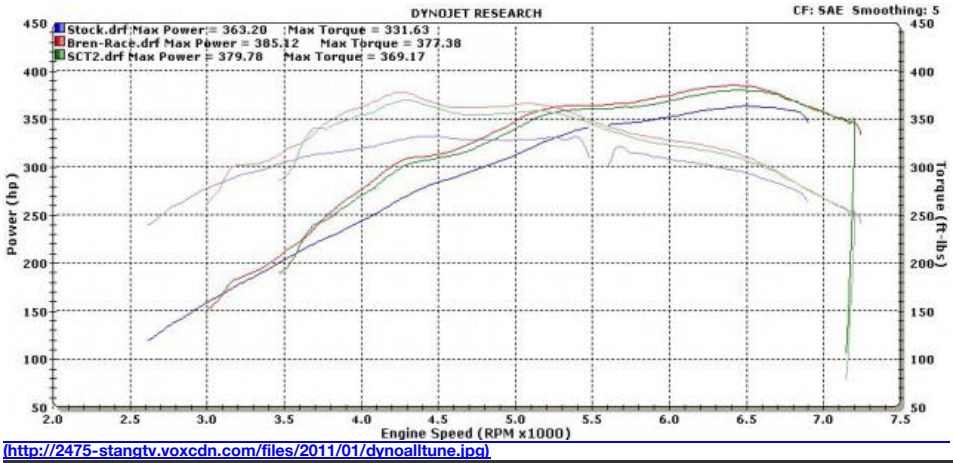
With the SCT strategy tune loaded, a considerable gain in torque was measured, with a gain of **37 lb/ft over stock and an additional 16 horsepower**. With the adjusted rev limiter, the 5.0 now sings to 7200 RPM. Also with the SCT tune, air/fuels registered a conservative 12.2:1 on average.

(http://2475-stangtv.voxcdn.com/files/2011/01/IMG_2304.jpg)

We were a bit skeptical on the torque numbers until we ran the tune multiple times with repeat results. Even when we loaded the Brenspeed Race tune, the numbers grew further. The Brenspeed tune made an **additional 5 horsepower and 8 lb/ft of torque** over the SCT strategy tune. One of the obvious gains we could see at the dyno was the leaner air/fuel ratios. While they are about half a point leaner at 12.8:1, it is still safe for a naturally aspirated combination.

With total gains of 22 RWHP and 38 lb/ft or torque, it was the easiest way to increase horsepower on our 2011 GT. It takes less than 15 minutes of tune to load the tune files into the Mustang's computer and requires virtually no mechanical experience. Not only is that a huge seat-of-the-pants difference at wide

open throttle, the adjustments made to the torque management and drive-by-wire settings make the Mustang much more fun to drive overall. We know that when it comes to modifying the Mustang down the road that there might be other modifications that make more horsepower than the SCT SF3, but none that is as easy to get there.


DYNOJET RESEARCH
CF: SAE Smoothing: 5
Stock.drf Max Power = 363.20 Max Torque = 331.63
Bren-Race.drf Max Power = 385.12 Max Torque = 377.38
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Power (hp)
Torque (ft-lbs)
Engine Speed (RPM x1000)

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Total power improvements was 22 RWHP and 38 lb/ft over stock for the Brenspeed Race tune. The SCT stategy tune came in at 5 horsepower and 8 lb/ft of torque over the custom tune, though still impressive gains. Click the picture for a larger version of the graph.

Recap on the numbers

- Stock – 363 RWHP 331 lb/ft
- SCT Strategy Tune – 380 RWHP 369 lb/ft – **Gain of 16 HP and 37 lb/ft over stock**
- Brenspeed Race Tune – 385 RWHP 377 lb/ft – **Gain of 5 HP and 8 lb/ft over SCT Strategy Tune — 22 HP and 45 lb/ft over stock**

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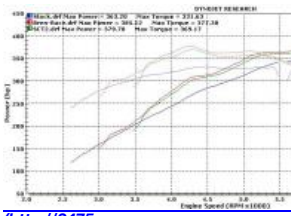

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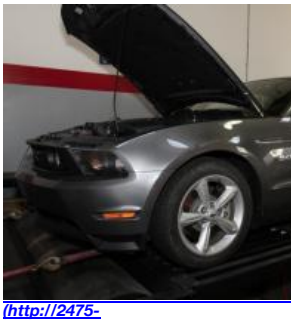
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